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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/675,455	09/30/2003	Seok-Yoon Yang	YOM-0062	5598

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EXAMINER	
WALKE, AMANDA C	
ART UNIT	PAPER NUMBER
1795	

MAIL DATE	DELIVERY MODE
07/10/2008	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/675,455	YANG ET AL.	
	Examiner	Art Unit	
	Amanda C. Walke	1795	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *25 February 2008*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-16* is/are pending in the application.

4a) Of the above claim(s) *11-15* is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-10 and 16* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

2. Claims 1-10 and 16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sakurai et al (6,348,298) in view of Ishibashi (2004/0048200) or Tsuchiya (4,749,727).

Sakurai et al disclose a radiation sensitive composition comprising (A) a colorant containing a quinacridone pigment, a mixture of an isoindolinone pigment and a yellow organic pigment or a mixture of copper phthalocyanine blue and a green pigment, (B) an alkali-soluble resin, (C) a polyfunctional monomer and (D) a photopolymerization initiator. The composition is useful for production of an additive or subtractive color filter which is used in a reflection-type color liquid crystal display device. According to the present invention, firstly, the above objects and advantages of the present invention can be attained by a radiation sensitive composition (may be referred to as "the first radiation sensitive composition of the present invention" hereinafter) comprising:

(A1) a colorant containing a quinacridone pigment
wherein R.sup.1 to R.sup.8 are independently a hydrogen atom, a methyl group or a chlorine atom;

(B) an alkali-soluble resin;
(C) a polyfunctional monomer; and

(D) a photopolymerization initiator.
The pigments used in the present invention can be used in conjunction with a dispersant as desired.
The dispersant is, for example, a cationic, anionic, nonionic, amphoteric, silicone-based or fluorine-based surfactant.

Illustrative examples of the surfactant include polyoxyethylene alkyl ethers such as polyoxyethylene lauryl ether, polyoxyethylene stearyl ether and polyoxyethylene oleyl ether; polyoxyethylene alkylphenyl ethers such as polyoxyethylene octylphenyl ether and polyoxyethylene nonylphenyl ether; polyethylene glycol diesters such as polyethylene glycol dilaurate and polyethylene glycol distearate; sorbitan fatty acid esters; fatty acid modified polyesters; tertiary amine modified polyurethanes; polyethylene imines; and the like. The surfactant is also available under the trade name of KP (of Shin-Etsu Chemical Co.), Polyflow (of Kyoeisha Kagaku Kabushiki Kaisha), F-Top (Tokem Products Co.), Megafac (Dainippon Ink and Chemicals, Inc.), Florade (Sumitomo 3M Limited), Asahi Guard and Surflon (of Asahi Glass Co.) and the like.

The surfactant listed above can be used alone or in admixture of two or more.
The amount of the surfactant used is generally 50 parts or less by weight, preferably 0 to 30 parts by weight, based on 100 parts by weight of the total of all pigments.

As the alkali-soluble resin in the present invention, any resin can be used as long as it serves as a binder for the colorant (A) and is soluble in a developer, particularly preferably an alkali developer used in a development process in the production of a color filter. The alkali-soluble resin is preferably a carboxyl group-containing polymer, particularly a copolymer (to be simply referred to as "carboxyl group-containing copolymer" hereinafter) of an

ethylenically unsaturated monomer having at least one carboxyl group (to be simply referred to as "carboxyl group-containing unsaturated monomer" hereinafter) and other copolymerizable ethylenically unsaturated monomer (to be simply referred to as "copolymerizable unsaturated monomer" hereinafter). Illustrative examples of the carboxyl group-containing copolymer (I) include (meth)acrylic acid/methyl (meth)acrylate copolymer; (meth)acrylic acid/benzyl (meth)acrylate copolymer; (meth)acrylic acid/2-hydroxyethyl (meth)acrylate/benzyl (meth)acrylate copolymer; (meth)acrylic acid/methyl (meth)acrylate/polystyrene macromonomer copolymer, (meth)acrylic acid/methyl (meth)acrylate/polymethyl methacrylate macromonomer copolymer; (meth)acrylic acid/benzyl (meth)acrylate/polystyrene macromonomer copolymer; (meth)acrylic acid/benzyl (meth)acrylate/polymethyl methacrylate macromonomer copolymer; (meth)acrylic acid/2-hydroxyethyl (meth)acrylate/benzyl (meth)acrylate/polystyrene macromonomer copolymer; (meth)acrylic acid/2-hydroxyethyl (meth)acrylate/benzyl (meth)acrylate/polymethyl methacrylate macromonomer copolymer; methacrylic acid/styrene/benzyl methacrylate/N-phenyl maleimide copolymer; methacrylic acid/mono(2-acryloyloxyethyl) succinate/styrene/benzyl methacrylate/N-phenyl maleimide copolymer; methacrylic acid/mono(2-acryloyloxyethyl) succinate/styrene/allyl methacrylate/N-phenyl maleimide copolymer; and the like.

The proportion of the carboxyl group-containing unsaturated monomer in the carboxyl group-containing copolymer is generally 5 to 50 wt %, preferably 10 to 40 wt %. When the proportion is less than 5 wt %, the solubility of the obtained radiation sensitive composition in an alkali developer is liable to lower. On the other hand, when the proportion is more than

50 wt %, the solubility becomes too high, whereby the formed pixels are liable to fall off from the substrate, or the surface of each of the pixels is liable to be roughened at the time of development with an alkali developer.

The polyfunctional monomer in the present invention is a monomer having two or more polymerizable unsaturated bonds. Illustrative examples of the polyfunctional monomer include diacrylates and dimethacrylates of alkylene glycol such as ethylene glycol and propylene glycol; diacrylates and dimethacrylates of polyalkylene glycol such as polyethylene glycol and polypropylene glycol; polyacrylates and polymethacrylates of polyhydric alcohols having a valence of 3 or more such as glycerine, trimethylolpropane, pentaerythritol and dipentaerythritol, and dicarboxylic acid modified products thereof; oligoacrylates and oligomethacrylates such as polyesters, epoxy resins, urethane resins, alkyd resins, silicone resins and spiran resins; diacrylates and dimethacrylates of both terminal hydroxylated polymers such as both terminal hydroxypoly-1,3-butadiene, both terminal hydroxypolyisoprene and both terminal hydroxypolycaprolactone; tris(2-acryloyloxyethyl)phosphate, tris(2-methacryloyloxyethyl)phosphate and the like. Out of these polyfunctional monomers, preferred are polyacrylates and polymethacrylates of polyhydric alcohols having a valence of 3 or more and dicarboxylic acid modified products thereof, such as trimethylolpropane triacrylate, trimethylolpropane trimethacrylate, pentaerythritol triacrylate, pentaerythritol trimethacrylate, pentaerythritol tetraacrylate, pentaerythritol tetramethacrylate, dipentaerythritol pentaacrylate, dipentaerythritol pentamethacrylate, dipentaerythritol hexaacrylate, dipentaerythritol hexamethacrylate, and compounds represented by the following formula (2), and particularly preferred are

trimethylolpropane triacrylate, pentaerythritol triacrylate and dipentaerythritol hexaacrylate because they have a high pixel strength and an excellent smooth pixel surface and hardly produce stains or film residues in an area other than a portion where pixels are formed.

The term "photopolymerization initiator" as used in the present invention refers to a compound which causes decomposition or the cleavage of a bond and forms an active species capable of initiating the polymerization of the above polyfunctional monomer (C), such as a radical, cation or anion, when exposed to radiation such as visible light, ultraviolet light, far ultraviolet light, electron beam or X-ray (to be referred to as "exposure" hereinafter). Illustrative examples of the photopolymerization initiator include imidazole-based compounds having at least one main skeleton represented by the following formulas (3), (4) or (5), benzoin-based compounds, acetophenone-based compounds, benzophenone-based compounds, .alpha.-diketone-based compounds, polynuclear quinone-based compounds, xanthone-based compounds, diazo-based compounds, triazine-based compounds and the like.

Preferred solvents include ethylene glycol monomethyl ether acetate, propylene glycol monomethyl ether, propylene glycol monomethyl ether acetate, propylene glycol monoethyl ether acetate, diethylene glycol dimethyl ether, diethylene glycol methylethyl ether, cyclohexanone, 2-heptanone, 3-heptanone, ethyl 2-hydroxypropionic acid, 3-methyl-3-methoxybutyl propionate, ethyl 3-methoxypropionic acid, methyl 3-ethoxypropionic acid, ethyl 3-ethoxypropionic acid, n-butyl acetate, i-butyl acetate, n-amyl formate, i-amyl acetate, n-butyl propionate, ethyl butyrate, i-propyl butyrate, n-butyl butyrate and ethylpyruvic acid are preferred in view of solubility, pigment dispersibility and application properties.

100 parts by weight of a mixture of C.I. Pigment Violet 19 and C.I. Pigment Orange 71 in a weight ratio of 75/25 as the colorant (A1), 60 parts by weight of a methacrylic acid/2-hydroxyethyl methacrylate/benzyl methacrylate copolymer (weight ratio=15/15/70, Mw=28,000) as the alkali-soluble resin (B), 40 parts by weight of dipentaerythritol hexaacrylate as the polyfunctional monomer (C), 10 parts by weight of 2,2'-bis(2,4-dichlorophenyl)-4,4',5,5'-tetraphenyl-1,2'-blimidazole and 10 parts by weight of 4,4'-bis(diethylamino)benzophenone as the photopolymerization initiator (D), and 1,000 parts by weight of ethyl 3-ethoxypropionic acid as a solvent were mixed together to prepare a liquid radiation sensitive composition (composition 1).

It would have been obvious to one of ordinary skill in the art to prepare the material of the example, choosing to replace either the of the methacrylate monomers with a glycidyl methacrylate as they are taught to be equivalent in column 8 of the reference, with reasonable expectation of achieving a color filter having optimized spectral transmittance.

Sakurai also teaches that additional additives include silanes such as 3-methacryloxypropyltrimethoxysilane, as well as other similar silanes may be added, but fails to disclose the specifically claimed compound.

Both Tsuchiya and Ishibashi teach resins having additives that include silane compounds including 3-methacryloxypropyltrimethoxysilane and 3-acryloxypropyltrimethoxysilane.

Given the teachings of the references, it would have been obvious to one of ordinary skill in the art to prepare the material of Sakurai choosing to employ another conventional silane, 3-acryloxypropyltrimethoxysilane taught to be conventional in the place of 3-methacryloxypropyltrimethoxysilane.

Response to Arguments

3. Applicant's arguments filed 2/25/08 have been fully considered but they are not persuasive. Applicant has argued that the references of record combined do not meet the instant claim limitations. Firstly, with respect to the amount of silane, given the amounts taught for the initiators and given for the crosslinking compounds in columns 13 and 14(which are also listed in the same passage with the silane adhesion promoters as additional additives). All of the additional additives are added in small amounts and given the amount of initiator, it appears that amount of curing and crosslinking agents / additional additives would fall within the instantly claimed range. The secondary reference teach known silanes in the same family as the silane adhesion promoters of the primary reference and list those taught by Sakurai thus showing that they are equivalent. Therefore it would have been obvious to employ one of the equivalent silanes in either of the secondary references as the silane in Sakurai. Furthermore, with respect to the instant claim 16, the claim is almost identical to the rejected claim 1 with the addition of requiring that the composition comprise a dispering agent/ surfactant which as discussed above, the Sakurai reference clearly does, in an amount falling within the instant claim limitations (see column 7). The claim was inadvertently not included in the rejection, but given the similarities to claim 1, should be included in the rejection. Had the applicant had any question and brought it to the attention of the examiner, she would have gladly prepared a supplemental action or interview summary clarifying the status of claim 16.

4. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Amanda C. Walke whose telephone number is 571-272-1337. The examiner can normally be reached on M-R 5:30-4.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Cynthia Kelly can be reached on 571-272-1526. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Amanda C Walke
Primary Examiner
Art Unit 1795

/Amanda C Walke/
Primary Examiner, Art Unit 1795

Application Number	Application/Control No.	Applicant(s)/Patent under Reexamination	
	10/675,455	YANG ET AL.	
	Examiner	Art Unit	
	Amanda C. Walke	1795	